STAT

July 27, 1964

LINEAR PHASOLVER MEASURING ENGINE

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Preparation of an acceptable driver pattern by [   ]   STAT
[   ] is the key to final completion of the program.   STAT

The rotary phasolver was developed by the [   ]   STAT
poration for digital measurement of shaft rotation to
a very high accuracy. The rotary phasolver is part of
[   ] product line. John R. recognized that the   STAT
rotary phasolver principles would be applicable to linear
measurements, possibly to accuracies finer than a micron
over distances of 10 inches or more. Accordingly, a
feasibility demonstration was contracted to prove whether
or not it was indeed possible to achieve submicron
measuring with the linear phasolver.

The phasolver uses two glass plates a few thousandths of
an inch apart. One is the driver plate on which sinusoidal
conducting patterns are imprinted. The other is the
coupler plate on which conducting bars are imprinted per-
pendicular to the line of measurement. CW electrical
signals are applied to the driver plate and detected by
the coupler plate. The phase angle of the output signal
depends on the relative position of the coupler bars
to the sinusoidal pattern on the driver. It is this
phase angle which is accurately measured to a fraction
of a micron and displayed on a digital counter.

The heart of the electrical problem is to produce highly
regulated signals of extremely fine stability. This
has been done and [   ] is satisfied that the   STAT
electronics are good to one-quarter (1/4) micron or
better. A customer demonstration, however, has not
yet been performed.

The heart of the mechanical problem is making the driver
and coupler plates. [   ] has turned to [   ] and   STAT

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[____] to put the patterns of high accuracy on the glass   STAT
plates. The accuracy of an individual sine wave pattern
on the driver or coupler bar on the coupler is not as
extreme as might be expected because the signal is
averaged over the entire 200 patterns.

Preparation of the coupler by [____] while not yet complete,   STAT
is not expected to be troublesome.

Preparation of the driver master by [____] is the item of   STAT
present concern. [____] can readily generate a single-   STAT
cycle master pattern but the iterative reproduction of
the single cycle without blemishes is a problem.

[_____] received a driver master from [____] on Friday,   STAT
July 17, but had to reject it because of a number of
blemishes. [____] will try again and expects to make a   STAT
good one by the end of this week, Friday, July 31.

Since successful completion of all the parts is so close
and the system suitability was demonstrated early in
the program, a successful feasibility demonstration
seems pretty well assured. It will take some time,
however, and the demonstration probably cannot take
place before October.

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